

KRASIL'NIKOV, Gennadiy Aleksandrovich; SOLENOK, Z.A., inzh.,
retsentent; SOKOL'SKIY, I.F., red.; USTINOVA, V.A.,
tekhn. red.

[Oil and water cooling of the transformers of the V.I.
Lenin Volga Hydroelectric Power Station] Masliano-
vodianoe okhlazhdenie transformatorov Volzhskoi TES im.
V.I.Lenina. Moskva, Gos.energ.izd-vo, 1960. 46 p.
(MIRA 16:10)

(Electric transformers--Cooling)
(Volga Hydroelectric Power Station (Lenin))

KRASIL'NIKOV, G.V.

Complete inertialess pneumatic-electric automation of the
section for the heat treatment of raw materials. Spirit.
prom. 22 no.4:27-29 '56. (MLRA 10:2)

1. Lomovskiy spirtovyy zavod.
(Automatic control) (Alcohol)

KRASIL'NIKOV, G.V.

"Instruments and regulators for the alcohol industry" by V.V. Aronovich. Reviewed by G.V. Krasil'nikov. Spirit. prom. 23 no. 5:43-44 '57.
(Distilling industries--Equipment and supplies) (MLPA 10:8)
(Aronovich, V.V.)

LARIN, M.N., prof., doktor tekhn.nauk; KRASIL'NIKOV, I.M.; TSYGANNOVA, M.P.; AKIMOV, A.V., kand.tekhn.nauk; BUDNIKOV, N.Ye., inzh.; PETROSYAN, L.K., kand.tekhn.nauk; DIBNER, L.G., inzh.; SILAYEVA, I.D., inzh.; MAGAZINER, Z.G., kand.tekhn.nauk; UVAROVA, A.F., tekhn.red.

[Cutting tools designed for high production and their efficient operation] Vysokoproizvoditel'nye konstruktsii reztsov i ikh ratsional'naia eksploatatsiya. Pod red. M.N.Larina. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 239 p.
(MIRA 12:6)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy institut. 2. Sotrudniki Vsesoyuznogo nauchno-issledovatel'skogo instrumental'nogo instituta (for all except Uvarova).

(Metal-cutting tools)

KRASIL'NIKOV I.P., inzh.; TEKHMISHCHYAN, A.V., kand. tekhn. nauk

Selection of a plan for cooling hydraulic coupling for the
drive of a powerful centrifuge. Obog. i brik. ugl. no.26:
25-32 '62. (MIRA 17-8)

SAYAPIN, YU. I., Eng.; KRASIL'NIKOV, I. V., Eng.;
KADYNOV, V. P., Eng.

Electric Power

Electric energy consumption in the preparation of reinforcements for hydrotechnical concrete. Hdr. stroi. 21 no. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. UNCLASSIFIED.

KRASIL'NIKOV, I.Ye.

Improving the operation of NIIPOL dryers. Obm. tekhn. opert. [VLP]
no. 4:8 '56. (MIRA II:10)
(Drying apparatus--Textile fabrics)

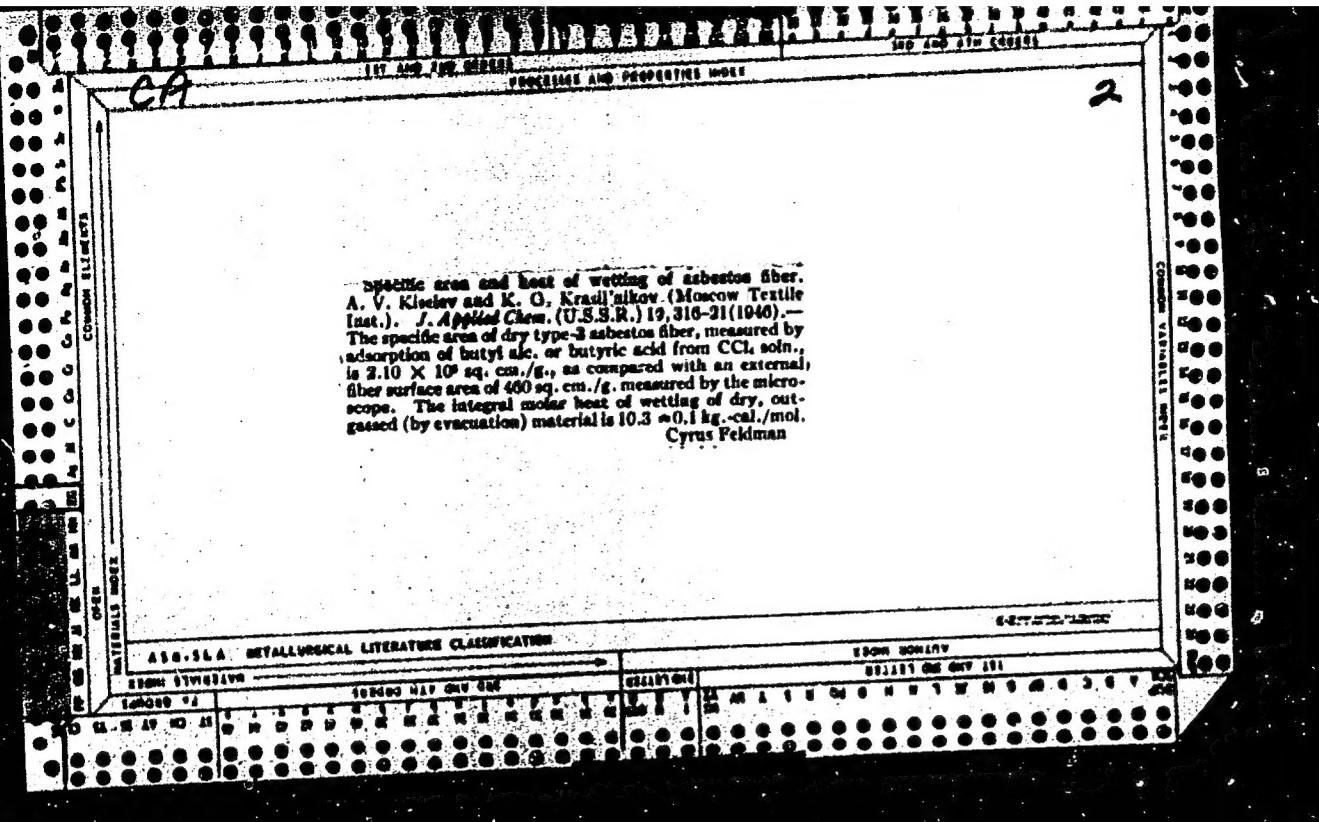
III AND TWO ORDERS
PROCESSES AND PROPERTIES INDEX

System $\text{CaO}-\text{SiO}_2-\text{H}_2\text{O}$. Sorption of calcium oxide by silica gel. K. G. Krasilnikov and A. V. Kuzilev (*J. Phys. Chem. Russ.*, 1944, 18, 327-335).—The amount of CaO taken up from aq. $\text{Ca}(\text{OH})_2$ by SiO_2 gel within, say, 1 hr. increases with $[\text{Ca}(\text{OH})_2]$ (0-45 m-equiv. per l.) according to the usual adsorption isotherm. 1 month later the sorption isotherm has a vertical branch at 3.2 m-equiv. of $\text{Ca}(\text{OH})_2$ per l.; the composition of the solid phase is $\text{CaO} \cdot \text{SiO}_2 \cdot \text{aq.}$ and the solution contains 0-7 m-equiv. of SiO_2 per l. At higher $[\text{Ca}(\text{OH})_2]$ no equilibrium is reached even within 17 months; probably more basic silicates are formed. Two native forms of hydrated SiO_2 behave like SiO_2 gel. J. J. B.

METALLURGICAL LITERATURE CLASSIFICATION

ALTRICCA INDEX

APPROVED FOR RELEASE: Monday, July 31, 2000 **CIA-RDP86-00513R000826110C**



"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826110

DZHIOIT, O. M., KISELEV, A. V. and KRASIL'NIKOV, K. G.

"Ca pillary," DOK. AN, 58, No. 3, 1947

APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826110C

CA

Adsorption Isotherms from Solutions on Layering or Crystallization. Adsorption of phenol on silica gel from solutions in heptane. K. G. Krail'nikov and A. V. Kiselyev. *Doklady Akad. Nauk SSSR*, 63, No. 6 (1948). On a fine pore (I) and a coarse-pore (II) silica gel, characterized by a max. of the effective pore radius distribution curve at, resp., 13.20 Å. and 51 Å., and by liquid H₂O adsorption at satn. of, resp., 0.63 and 0.92 cc./g., adsorption curves of PhOH in C₇H₁₆ soln. at 20° temp. of layering, the adsorption curve on II becomes S-shaped, whereas the curve on I remains normal. At the completion of capillary layering, at high relative concns., the compns. of the PhOH-rich layer. The limiting amounts of PhOH adsorbed at 40°, estd. from the isotherms, are, on I and II, resp., 4.2 and 7.4 millimoles/g., corresponding to 0.50 and 0.80 cc./g., resp. These vols. are close to the vols. of liquid H₂O adsorbed at satn., which fact indicates dense filling of the pores at completion of capillary layering, in contrast to the case of crystall. at 20°. The absence of an S-shaped rise on I indicates that its pores are practically filled already at low relative concns.; on II, the early stage of adsorption results only in coverage of the pure walls, the pore space being filled only at the stage of capillary layering.

2

capillary layering.

APPROVED FOR RELEASE: Monday, July 31, 2000 **CIA-RDP86-00513R00082611OC**

KRASIL'NIKOV, K. G. i KISELEV, A. V.

26220 Priroda sorbtsii CaO iz vodnykh rastverov silikatnykh i aluminatnykh
(Sistemy CaO---SiO₂-H₂O i CaO-Al₂O₃-H₂O) Sbornik nauch. rabot po vysazhivaniyu
materialov. M., 1949, s. 141-52

SO: LETOPIS' NO. 35, 1949

KRASIL'NIKOV, K. G.

"Adsorption from Solution by porous Bodies near the Critical Mixing Temperature.
The System Silice Gel-Acetic Acid - Heptane," Dokl. AN SSSR, 69, No. 6, 1949.

Inst. Physical Chemistry, Dept. Chem. Sci., Acad. Sci. USSR

KRASIL'NIKOV, K. G.

"Effect of the Structure of the Silica Gel on the Velocity of the Sorption of Calcium Hydroxide from Aqueous Solutions," O. M. Dzhigit, A. V. Kiselev, and K. G. Krasil'nikov (Gosudarst. Vsesoyuz. Nauch-Issledovatel. Inst. Tsement. Prom. and Moskov. Gosudarst. Univ. im M. V. Lomonosova). Dokl. Akad. Nauk SSSR, 71, 77-9, (1950) - The amts. of $\text{Ca}(\text{OH})_2$, in mg. -equiv./g., sorbed from a clear sq. soln. after a stated length of time (1 hr to 30 days), are plotted against the concn. of the soln. after sorption. The isotherms are substantially different for a coarsely-porous silica gel (I), characterized by marked capillary condensation and considerable hysteresis in the sorption of C_5H_{12} vapor at 20° , and a finely-porous silica gel (II) showing no capillary condensation under the same conditions. Pore vol. distribution curves show, for II, a sharp peak at about 10 Å., and in the range of 80-100 Å. for I. Sorption of $\text{Ca}(\text{OH})_2$ was detd. with fractions of I and II remaining after sifting with 10,000 mesh/sq. em., and heated 4 hrs. at 350° . All points of the isotherms corresponding to the same initial concn. lie on the same straight line which connects the point on the axis of abscissas expressing the original concn. of the soln. In the case of I, the 1-hr. isotherm shows irregularities of shape indicative of vol. sorption. Isotherms taken at later stages become increasingly straightened out; the 24-hr. isotherm is very nearly vertical, and, after 30 days, it corresponds to the equil. between the initial silica gel SiO_2 sq., the silicate $\text{CaO} \cdot \text{SiO}_2$ sq., and the sq. soln. The coarse pores of I permit ready diffusion of $\text{Ca}(\text{OH})_2$, and the Ca silicate formed does not prevent its access to the surface of yet unreacted SiO_2 . This is not so in the case of II. All isotherms, including that taken after 30 days show the familiar shape of initial rise and leveling off, and lie very closely one above the other. Sorption after 30 days is only a little greater than after 1 day.

*cat**2*

Uni- and multimolecular adsorption from solution on a nonporous adsorbent. A. V. Kiselev and K. G. Krasil'nikov (Moscow State Univ.), *Doklady Akad. Nauk S.S.R.* 77, 881-4 (1951).—Adsorption isotherms from solns. of PhOH in C₆H₆ on BaSO₄ powder of sp. surface area 0.7 sq. m./g. were detd. at 20°, where satn. leads to crystn. of PhOH, and at 40° where satn. results in sepn. into 2 liquid layers. At 20°, the isotherm levels off at a relatively low concn., 28 millimole/l. (i.e. 0.1 of satn.) and the adsorption remains practically unchanged up to satn. of the soln. and beyond it. This const. adsorption, 36 millimoles/g., corresponds to a surface area of 28 Å.²/mol. PhOH; consequently, under these conditions, only one close-packed unimol. adsorption layer is formed. At 40°, the isotherm is S shaped, beginning to rise at approx. a relative concn. $c/c_0 = 0.8$ ($c_0 = 1.3$ mole/l.). From this point on, adsorption is multimol., but the thickness of the adsorbed layer does not exceed 2-3 molec. even at $c/c_0 = 0.9$. A similar isotherm is found with MeOH in C₆H₆ on BaSO₄. N. Thon

[95]

KASIL'NIKOV, K.G.
J. A
1951

General and Physical Chemistry

Absolute adsorption isotherms from solution. K. G. Kasil'nikov and A. V. Kiselev (Moscow State Univ.) Trudy Akad. Nauk S.S.R. 77, 1047-50 (1951); cf. Argui, et al., C.R. 45, 5421g. Adsorption isotherms were detd. for solns. of PhOH in C_2H_6 at 20° and 40°, on the highly coarse silica gel "B" (I), the coarse silica gel "VK-Kh-2" (II), a relatively fine-pore silica gel "No. 45" (III), and nonporous $BaSO_4$ (IV). Total pore vol. in cc./g., most frequent pore diam. in Å, and sp. surface area σ in sq. m./g. were: for I 1.72, 200, 320; II 0.92, 90, 350; III 0.53, 30, 600; IV —, —, 9.7. At 20°, satn. in the vol. results in crystn., and at 40° in segm. into 2 liquid layers. The isotherm on I at 20° has the normal shape up to satn., whereas at 40° it is S-shaped. Plots of the amt. of PhOH adsorbed, a , per unit sp. surface area, S , as a function of its concn., c , at 20°, coincide for I, II, and III; consequently, the porosity of the silica gel shows no effect on the adsorption up to a pore size of 30 Å. Near satn., a/σ = micromole/sq. m., which gives $a/\sigma = 20$ Å./mol. PhOH, i.e. adsorption at 20° remains unimol. up to satn. Conversely, adsorption of PhOH from soln. in C_2H_6 can be used to det. the unknown sp. surface area of a silica gel. On IV, adsorption is still unimol., but the limit is reached at about $c = 0.1$ c.c.m. Plots of a/σ at 40°, on I, II, and IV, are still S-shaped, with the isotherms coinciding only in their initial portions but diverging beyond the initial stage. This divergence is the result of multilam. adsorption on IV, but is due to capillary layering in the case of the silica gels; the latter effect is more pronounced, the larger is the pore vol. That the rise of a/σ on coarse silica gels at higher concn. is not due to mere multilam. adsorption, or to layering in the space between grains, follows from the fact that in the range of relative concns. 0.7-1.0, a/σ is much greater, and rises more steeply with c , for the silica gels than for IV. Consequently, the effect consists in capillary layering, analogous to capillary condensation of vapors. At $c/c_c = 1$, I adsorbs 16-17 millimoles PhOH per g., or 1.8 cc. liquid PhOH/g. This, with some C_2H_6 , is sufficient for complete filling of the pore vol.

N. Thon

YEGOROV, M.M.; KISELEV, V.F.; KRASIL'NIKOV, K.G.; SIMANOV, Yu.P.

Effect of the phase composition of adsorbents in the system
 $\text{Al}_2\text{O}_3 - \text{H}_2\text{O}$ on their surface activity. Izv.vys.ucheb.zav.;
khim.i khim.tekh. 2 no.3:360-365 '59. (MIRA 13:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova,
kafedra fiziki.
(Aluminum oxide) (Surface chemistry)

KRASIL'NIKOV, K. G.

TRAJIL'NIKOV, F. S. -- "Investigation of Sorption of Dihydrated Calcium
Oxide by Silica." Sub 12 May 52, Moscow Order of Lenin Chemical-technological
Inst imeni D. I. Mendeleev. (Dissertation for the Degree of Candidate
in Technical Sciences).

SO: Yechernaya Moskva, January-December 1952

KISELEV, A. V., KRASIL'NIKOV, K. G., POKROVSKIY, N. L., AVGUL', N. N., DZHIGIT, O. M., SHCHERBAKVA, K. D.

Heat of Wetting

Dependence of the heat of wetting of silica gel with water on the surface coverage. Zhur. fiz. khim. 26 no. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

KRASIL'NIKOV, V. G.

234T20

USSR/Chemistry - Adsorption

1 Sep 52

"Studying the Adsorption and Heat of Adsorption of Phenol in Aqueous Solution on Nonporous Carbon Black,"
A. F. Frenel, Moscow State U
V. P. Kiselev, K. G. Krasil'nikov, Moscow State U
imeni M. V. Lomonosov and Inst of Phys Chem, Acad. of
Sci USSR

"Dok. Ak Nauk SSSR" Vol 86, No 1, pp 111-113

The heat of adsorption and adsorption isotherms of phenol-water solns close to the spn concn were studied. The curves for the adsorption and the heat of adsorption are S-shaped. Increase in adsorption

234T20

and in heat of adsorption in the region of concns close to the point of spn (layer formation) apparently are related to polymol adsorption. At that point on the adsorption isotherm, where the curve has a stepwise character, the heat of adsorption curve has a series of minima. Presented by Acad M. M. Dubinin 5 Jul 52.

234T20

KRASILNIKOV, K. G.
J. S. K.

The effect of dehydration of a silica-gel surface on its adsorption properties. A. V. Kiselev, A. G. Krashnikov and L. N. Boboleva [In: V. I. Komarov (ed.), Univ. Moscow], Doklady Akad. Nauk S.S.R. 24, 83-8 (1964).—The effect of the chain structure and the state of an adsorbent surface on the χ_{AB} values of the adsorption and the energy of adsorption was determined on partially dehydrated SiO_2 gel. The adsorbates were MeOH and C_2H_5 vapors and phenol in C_4H_{10} solution. The removal of OH groups from the SiO_2 gel surface by dehydration lowers the adsorption of all of the adsorbates but it is particularly significant for those that can form H bonds with the OH groups of the adsorbent surface (MeOH , $\text{C}_2\text{H}_5\text{OH}$).
J. Roytar Leach

KRASIL'NIKOV, K. G.

USSR /Chemical Technology. Chemical Products
and Their Application

I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31640

Author : Krasil'nikov K. G.

Title : Chemical Processes in Dispersed Bodies (Study
of the System CaO - SiO₂ - H₂O).

Orig Pub: Tr. Soveshchaniya po khimii tsementa. M.,
Promstroyizdat, 1956, 351-380

Abstract: Description of the results of the study of equilibrium
in the CaO-SiO₂-H₂O system, at different
values of the CaO/SiO₂ ratio, conducted by
utilizing modern adsorption research methods
and, in individual cases, of electron-microscopic,

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USSR /Chemical Technology. Chemical Products
and Their Application

I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31640

petrographic, roentgenographic and adsorptional
structure method of analysis.

Card 2/2

YEGOROV, M.M.; KRASIL'NIKOV, K.O.; SYSOYEV, Ye.A.

Water wetting heats of various silica gels with reference to their degree of hydration. Dokl.AN SSSR 108 no.1:103-106 My '56.

(MLRA 9:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
Predstavлено академиком М.М. Дубининым.
(Silica) (Heat of wetting)

KRASIL'NIKOV, K. G.

USSR/ Physical Chemistry - Surface phenomena. Adsorption. Chromatography.
Ion exchange

B-13

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11393

Author : Aleksandrova G.I., Kiselev V.F., Krasil'nikov K.G., Murina V.V.,
Sysoyev Ye.A.

Inst : Academy of Sciences USSR

Title : Heat of Wetting of Silicagel of Different Degrees of Hydration by
Some Organic Liquids

Orig Pub : Dokl. AN SSSR, 1956, 108, No 2, 283-286

Abstract : Determined were the heat values of wetting of surface unit of dehydrated,
at 300-900°, of specimens of silicagel (SG) of different porosity by ab-
solute methanol (Q_1), n-propanol (Q_2) and non-polar n-heptane (Q_3). Q_1
does not depend on the nature of porosity of SG; Q_2 and Q_3 are higher in
the case of coarsely porous SG, than for finely porous, which is attribu-
ted to the effect of pores which increases on transition to larger molecu-
les of C_3H_7OH and C_7H_{14} . Q_1 and Q_2 increase linearly with degree of hy-
dration (θ_{H_2O}) of SG surface, which confirms (see reference) the assum-

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USSR/ Physical Chemistry - Surface phenomena. Adsorption, Chromatography.
Ion exchange

B-13

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11393

ption of heterogeneity of SG surface. Q_3 is almost not dependent on H_2O . The conclusion is arrived at that most of the earlier data on heat of wetting of SG are not mutually comparable since no account was taken of the correlation between Q and H_2O and the nature of porosity of SG (see RZhKhim, 1956, 77773)

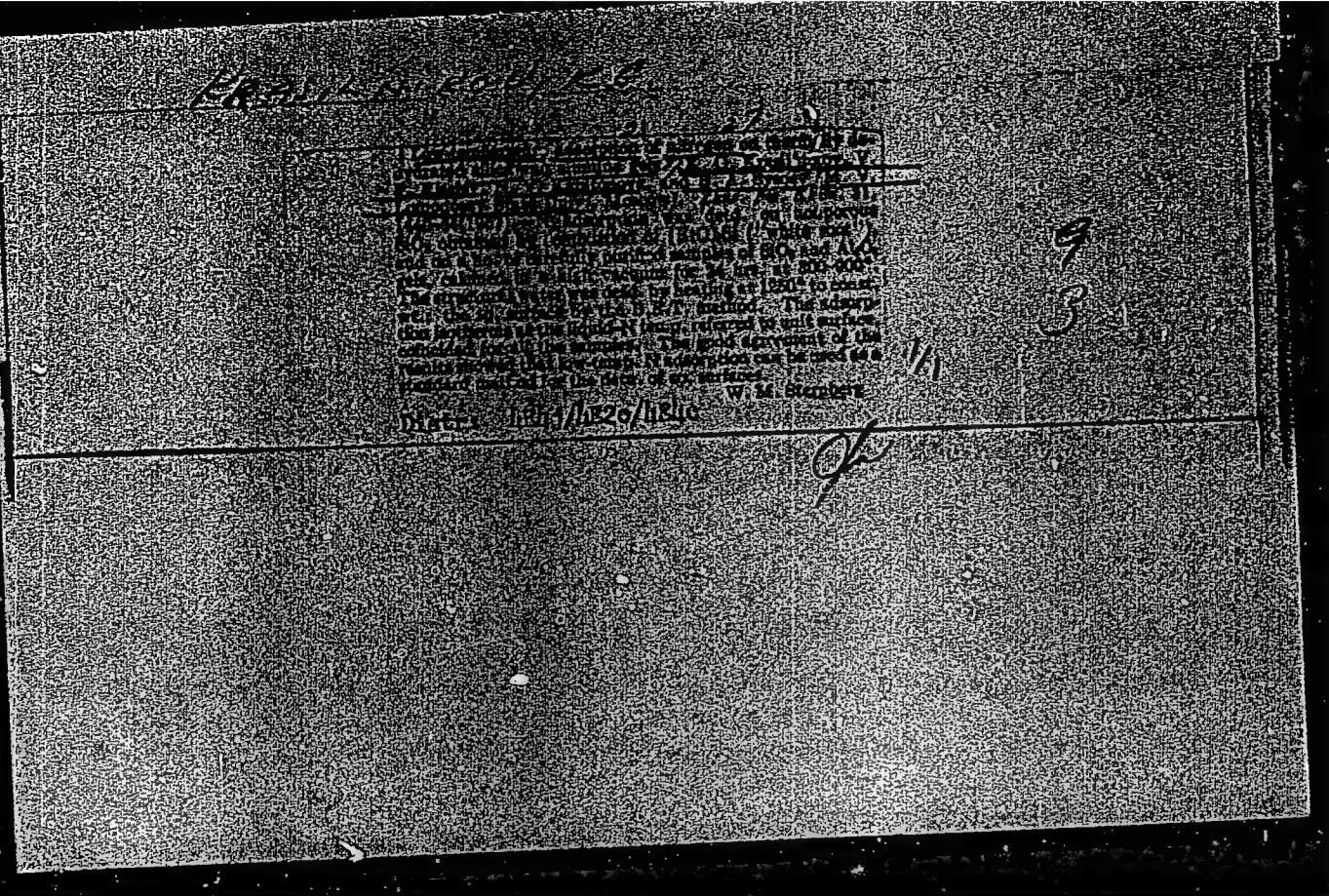
2/2

IL'IN, B.V.; KISELEV, V.F.; KRASIL'NIKOV, K.G.

Effect of the surface nature of silica on its absorption
properties. Part 1. Vest. Mosk. un. Ser. mat., mekh., astron.
fiz., khim. 12 no. 6:35-50 '57. (MIRA 11:10)

1. Kafedra obshchey fiziki dlia khimicheskogo fakul'teta Moskovskogo
gosudarstvennogo universiteta.
(Silica)
(Absorption)

"APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110



APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110C

20-114-3-35/60

AUTHORS:

Yegorov, M. M., Yegorova, T. S., Kiselev, V. F.,
Krasil'nikov, K. G.

TITLE:

The Adsorption of Water Vapors on Silica Gels Hydrated to
Varied Degrees (Adsorbsiya parov vody na silikagelyakh razlichnoy
stepeni gidratatsii)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 3, pp 579-582 (USSR)

ABSTRACT:

As is known, the adsorption of water vapors on silica gels is characteristic by some specific properties. Some previously published scientific papers have investigated in detail the irreversible adsorption of water vapors which is connected with an additional hydration of the silica-gel surface in the process of adsorption. Other investigations reached the conclusion that the isotherm of the adsorption of water vapors, depending on the degree of the dehydration of the silica-gel surface and of porous glasses, is transformed from a convex surface into a concave line, the latter corresponding to a hydrophobic surface. There exist different divergences in computing the specific surfaces of silica gels from the isothermal lines. None of the authors of the above-mentioned scientific papers

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The Adsorption of Water Vapors on Silica Gels Hydrated to Varied Degrees

conducted the chemical analysis of the surfaces of the silica gels and of porous glasses. This task was now performed by the authors of the paper under review. Figure Nr 1 of the paper under review represents the isotherms of the water vapors on the initial silica gels and also the curves of distribution - as computed from the desorption branches - of the pore volume with respect to their effective diameter taking into account the thickness of the adsorbed film. Figure Nr 2 contains the initial segments of the primary vapor adsorption on all samples of silica gels, computed for 1 m^2 of the surface. It can be seen from figure Nr 2 that the isotherms of the three initial samples, worked at 300 degrees centigrade, are placed in such a way that p/p_s being the same, the adsorption decreases with a decrease in the degree of hydration of the surface, and this corresponding to the observed reduction in heat of the water moistening of the same samples. The state attained at the water adsorption at the thermally dehydrated surfaces are not equilibrated, as far as in this case the process of monohydration of the surface can take place. However, in the monomolecular range at small p/p , this process is very slow. Therefore it is possible to consider the isotherms of the figure Nr 2A of the silica gel samples K-2, annealed at high tempera-

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The Adsorption of Water Vapors on Silica Gels Hydrated to Varied Dose. 33

tures, as equivalent from the point of view of adsorption. For this purpose, however, one has to neglect the slight modification of the surface hydration during the process of establishing the adsorption equilibrium. If these isotherms are compared with the previous ones, it can be seen that, depending on the surface hydration, they change their form and become concave. It is furthermore observed that in this context the capacity of adsorption of the silica gel decreases. Quite a number of assumptions - as found in relevant scientific literature - on the mechanism of adsorption of water vapors on silica gel and on the hydration of its surface, are in contradiction to each other; these assumptions are based on adsorption data and also on the investigation of the infrared spectra of the surface layer. In order to clarify these questions, additional research is necessary, namely study of adsorption linked with spectroscopic investigations. There are 2 figures, 1 table, and 20 references, 14 of which are Slavic.

Card 3/4

20-114-3-35/60

The Adsorption of Water Vapors on Silica Gels Hydrated to Varied Degrees

ASSOCIATION: Moscow State University imeni M. V. Lomonosov
(Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova)

PRESENTED: December 14, 1956, by M. M. Dubinin, Member of the Academy

SUBMITTED: December 10, 1956

Card 4/4

AUTHORS: Bonetskaya, A. K., Krasil'nikov, K. G. 20-114-6-33/54

TITLE: The Adsorption of Aliphatic Alcohols From Solutions on
Silica Gel and White Soot
(Adsorbsiya alifaticheskikh spirtov iz rastvorov na
silikagеле i beloy sazhe).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 114, Nr 6, pp. 1257-1260 (USSR)

ABSTRACT: From earlier papers (references 1,2,11) follows that the adsorbed maximum amount of alcohols and acids of the homologous series with an increase in the hydrocarbon radical decreases to porous hydrophile adsorbents. In this connection the highest adsorption value in the case of comparatively coarse-grained adsorbents remains constant (references 3,11). The reduction of absorption in the homologous series was explained by a volume-interaction in solutions (different solubility of the terms of the homologous series, reference 1) or ascribed to the influence of the porous structure of the adsorbent (references 3,5). In the case of the nonporous hydrophile adsorbents it could be expected (references 2-4) that the adsorbed maximum quantity of the alcohols and acids of the homologous series was constant. The adsorption measurements

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The Adsorption of Aliphatic Alcohols From Solutions on
Silica Gel and White Soot

20-114-6-33/54

Card 2/5

on nonporous hydrophobe adsorbents for unlimitedly soluble alcohols and acids from aqueous solutions (references 6,7) show that the limit of adsorption is shifted upward with the number of carbon atoms in the molecule. Comparisons of adsorption isothermal lines for hydrophile adsorbents are, as far as is known, absent. In the present work the authors performed the adsorption of a number of normal aliphatic alcohols from solutions in CCl_4 on 2 silica samples of different structure. Silica gel KSK-2 (reference 9) was the porous sample. So-called white soot was used as nonporous sample. The samples were sharply different in their structure, but possessed a practically equal hydrated surface. As follows from figure 1 A, the results obtained from both samples are qualitatively not different from each other, for in both cases the maximum value of adsorption decreases with the lengthening of the carbon chain. This value is shifted into the domain of smaller equilibrium concentrations (reference 12). If it is assumed that this decrease can be effected by the competition of the solvent, the adsorption of the latter should increase with

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a decrease of the adsorption of alcohol, i.e. on transition to the higher alcohols. The authors tried an extrapolation of the inclined part of the adsorption isotherm of octyl-alcohol on silica gel to the domain of high concentrations, so that a value was obtained which lies close to the concentration of pure alcohol. Due to the inaccuracy of such an extrapolation additional tests on the adsorption of CCl_4 and its solutions in octylalcohol were carried out. But no perceptible modifications of adsorption were determined in the domain of concentrations in question here. From the isothermal lines obtained the authors calculated the values of the total content of the adsorbed substance in the surface layer a (table 1). Thus the decrease in adsorption of the alcohols with a lengthening of the hydrocarbon chain cannot be ascribed to the competition of the solvent. The authors try to explain this phenomenon by a special mode of orientation of the alcohol-molecules in the solid surface layer so that the chains predominantly "lie" on the surface. In such a case the surface taken up by the molecule will be dependent on the above-mentioned length of chain. For determining the

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The Adsorption of Aliphatic Alcohols From Solutions on
Silica Gel and White Soot

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influence of the porous structure upon the maximum value of absorption the obtained results were related to 1 m. of the surface. The adsorption isothermal lines of methyl alcohol on both adsorbents agree (figure 1 B). The adsorption on the porous sample increases with increasing number of carbon atoms. According to table 1 and figure 2 the maximum volume of the adsorption of all investigated alcohols changes little on nonporous soot.
There are 2 figures, 1 tables, and 16 references,
11 of which are Slavic.

ASSOCIATION: Moscow State University imeni M. V. Lomonosov,

(Moskovskiy gosudarstvennyy universitet im. M. V.
Lomonosova)

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The Adsorption of Aliphatic Alcohols From Solutions on
Silica Gel and White Soot

20-114-6-33/54

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SUBMITTED: December 29, 1956

Card 5/5

KRASIL'NIKOV, K.G.

AUTHORS:

Krasil'nikov, K. G., Kiselev, V. F., Sysoyev, Ye. A. 20-6-27/42

TITLE:

Nature of the Surface of a Dehydrated Silicagel
(K voprosu o prirode poverkhnosti degidratirovannogo
silikagelya)

PERIODICAL:

Doklady AN SSSR, 1957, Vol. 116, Nr 6, pp. 990-993 (USSR)

ABSTRACT:

The authors carried out quantitative measurements of the adsorption of nitrogen and oxygen on silicagels which were dehydrated in high vacuum. The adsorption was measured by means of the volum method. The silicagel test piece was introduced into a quartz ampule and annealed after previous draining at 300°C at an assumed temperature. Then the prepared portion of the gas to be investigated was introduced into the ampule and the corresponding measurements were carried out at 200°C. Nitrogen is not adsorbed under these conditions within the accuracy of measurement. With oxygen, the surface of silicagel dehydrated in vacuum at temperatures of 300 to 900°C adsorbs the oxygen to a considerable extent. Hereby the quantity of adsorbed oxygen grows with an increase of the annealing temperature. The effect of a short-wave radiation and the thermic dehydration in the final effect apparently lead to the same properties of the surface. The authors further investigated the

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~~Structure of the Surface of a Dehydrated Silicagel~~

20-6-27/42

heats of wetting of the silicagels with water in which case these silicagels were previously annealed in vacuum at various temperatures up to 800° C. The data obtained during this operation are summarized in a table. The two silicagels investigated here, produce after annealing in vacuum a greater heat of wetting than the same test pieces annealed in air. On the surface of the silicagel dehydrated in vacuum, centers with higher activity of adsorption than with the OH-groups are formed. The results obtained in this case agree with the measurements of other authors (reference 11,12). There are 2 figures and 12 references, 8 of which are Slavic.

ASSOCIATION: Moscow State University im. M. V. Lomonosov
(Moskovskiy gosudarstvenny universitet im. M. V. Lomonosova).

PRESENTED: May 4, 1957, by M. M. Dubinin, Academician.

SUBMITTED: May 26, 1957

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: Yegorov, M.M., Yegorova, T.S., Kiselev, V.F., SOV/55-58-1-27/33
and Krasil'nikov, K.G.

TITLE: Influence of the Nature of the Silica Gel Surface on the
Adsorption of the Methyl Alcohol Vapors (Vliyaniye prirody poverkhnosti silikagelya na adsorbsiyu parov metilovogo spirta)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya fiziko-matematicheskikh i yestestvennykh nauk, 1958, Nr 1, pp 203-207 (USSR)

ABSTRACT: The paper is written under the leading of Professor B.V. Il'in and contains the results of a detailed measuring of methyl alcohol vapors which in the monomolecular range have been adsorbed at the surface of the silica gel. Before the experiment, the surface of the silica gel was submitted to the influence of saturated water vapor up to 48 hours. The results are collected in a table and two figures.
There are 15 Soviet references.

ASSOCIATION: Kafedra obshchey fiziki dlya khimicheskogo fakul'teta (Chair of General Physics of the Department of Chemistry)

SUBMITTED: May 3, 1957

Card 1/1

5(4)
AUTHORS:

Il'in,B.V., Kiselev,V.F., and
Krasil'nikov, K.G.

SOV/55-58-2-31/35

TITLE:

Heat of Wetting of the Silica Gels of Different Degrees of
Hydration (Teploty smachivaniya silikageley razlichnoy
stepeni gidratatsii)

PERIODICAL:

Vestnik Voskovskogo Universiteta. Seriya matematiki, mekhaniki,
astronomii, fiziki, khimii, 1958,Nr 2,pp 223-232 (USSR)

ABSTRACT:

The paper contains the results of a systematic investigation
of the heat of wetting of different kinds of silica gels.
The wetting of the surface was carried out by water, n-propyl-
alcohols and n-heptane. The structural water content of the
silica gel was taken into account. Already known properties
were essentially confirmed. The opinion of A.V. Kiselev and
his collaborators [Ref 9-16] was not confirmed according to
which the unit of the surface of the silica gel possesses
certain "absolute" energetic properties. This is not the
case : The properties of the surface essentially depend on
the preceding treatment (annealing etc), i.e. on the bound
water content of the surface layer.
There are 6 figures, and 25 references, 15 of which are Soviet,

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Heat of Wetting of the Silica Gels of Different
Degrees of Hydration

SOV/55-58-2-31/35

7 American, 1 English, and 2 French.

ASSOCIATION: Kafedra obshchey fiziki dlya khimicheskogo fakulteta
(Chair of General Physics of the Faculty of Chemistry)

SUBMITTED: April 14, 1957

Card 2/2

AUTHORS: Kiselev, V.F., Krasil'nikov, K. G. SOV/76-32-6-45/46

TITLE: The Specific Character of the Adsorption of Phenol by Silicagel
From Heptane Solutions (Osobennosti adsorbsii fenola iz
rastvorov v geptane silikagelem)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 6, pp 1435-1436
(USSR)

ABSTRACT: In a previous paper it was found that the initial domain of the adsorption isothermal line shows a steplike character; more accurate measurements in this field showed that great changes of the integral heat adsorption according to the concentration take place. In connection with observations made by other authors it turned out to be interesting to carry out parallel experiments of the adsorption of phenol from solutions for purposes of investigating the adsorption isothermal line on the one hand and the heat of wetting of the same solutions on the same silicagel on the other hand. The authors used a coarse-pored silicagel KSK-1, the methods of measurement remaining the same as in the previous paper. The experimental results obtained do not yet permit the interpretation of the observations made, however, the authors put forward some ex-

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The Specific Character of the Adsorption of Phenol by SOV/76-32-6-45/46
Silicagel From Heptane Solutions

planations from which it may be seen that the phenomena are due to the complicated process of the filling of the surface of the adsorbent, which according to its properties is inhomogeneous, with the molecules of the substance to be adsorbed. It was found that the change of the chemical nature of the surface of the adsorbent caused by different ways of treatment (e.g. dehydration) can lead to the occurrence of steps in the isothermal line or to their removal, respectively. In order to be able to explain the occurrence of maxima and minima found on the isothermal line of the heat of wetting, or to find a possible connection with the step-phenomenon on the adsorption isothermal line more experiments will have to be carried out. There are 2 figures and 8 references, 7 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova
(Moscow State University imeni M.V. Lomonosov)

SUBMITTED: December 11, 1957

Card 2/3

The Specific Character of the Adsorption of Phenol by SOV/76-32-6-45/46
Silicagel From Heptane Solutions

1. Phenols--Adsorption 2. Colloidals--Adsorptive properties

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5(4)

AUTHORS: Yegorov, M. M., Krasil'nikov, K. G., SSV/76-32-10-55/39
Kiselev, V. F.

TITLE: The Influence of the Nature of Silica Gel and Quartz
Surfaces on Adsorption Properties (Vliyaniye prirody poverkhnosti silikagelya i kvartsa na ikh adsorbsionnyye svoystva)
I. Investigations of the Hydration of the Silicon Dioxide
Surface (I. Issledovaniya gidratatsii poverkhnosti
kremnezema)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 10,
pp 2448 - 2454 (USSR)

ABSTRACT: Of late the presence of hydroxyl groups on silicon
dioxide surfaces was found in investigations (Refs 6-13).
The present paper deals in detail with investigations of
the degree of hydration in dependence on the annealing
in 7 different SiO_2 samples. The silica gel KSK was
carefully purified; silica gel K-2 was obtained by a
distillation of SiCl_4 according to a method mentioned
(Ref 3), and after storing under water it was termed
silica gel K-3. "White root" and ground quartz (sample
BS-1) were used as non-porous samples. The determinations

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The Influence of the Nature of Silica Gel and Quartz Surfaces on Adsorption Properties. I. Investigations of the Hydration of the Silicon Dioxide Surface 507/76-32-15-33/32

of the specific surfaces of the samples were carried out according to the BET method by means of nitrogen vapors. All silica gel samples used belong to the type of coarsely porous adsorbents (Ref 16). Diagrams of the function of the water content versus the annealing temperature of the silica gels KSK-1, KSK-2, K-2 and K-3 are given using data by Shapiro and Weiss(Veys) (Ref 14) as well as by Bastick (Bastik)(Refs 4,17). The standard temperature for treating the samples was chosen to be 300°. The results show that the content of the water of constitution as related to the surface unit is different for various silica gels. In the case where the samples were treated exactly the same but a different specific surface was present no surfaces with the same degree of hydration could be obtained, which proves the incorrectness of the data mentioned in reference 21. On storing the samples in water it was found that the amount of water of constitution on the surface increased sharply. However, those samples treated

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The Influence of the Nature of Silica Gel and Quartz Surfaces on Adsorption Properties. I: Investigations of the Hydration of the Silicon Dioxide Surface SOV/76-32-10-33/39

at 300° after storing always had smaller amounts than those without any temperature treatment. The process of dehydration and secondary hydration was irreversible under the conditions present. The degree of hydration depends on the crystal chemical properties of the surface structure and is determined by the valence number of the surface atoms that are loosely bound. The surface hydration of all samples investigated treated under the same conditions was different and amounted to a maximum of 4,78 μ M/m². A paper by Eiler (Iler) (Ref 4) is mentioned; the authors thank B.V.Il'in. There are 3 figures, 1 table, and 23 references, 12 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im.M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

Card 3'4

The Influence of the Nature of Silica Gel and Quartz Surfaces on Adsorption Properties. I. Investigations of the Hydration of the Silicon Dioxide Surface SOT/76-32-10-33/39

SUBMITTED: June 5, 1957

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5(4)
AUTHORS:

Yegorov, M. M., Yegorova, T. S., Krasilnikov, V. G.
Kiselev, V. F.

SCV/76-32-11-25/32

TITLE:

The Effect of the Nature of the Silica Gel and Quartz Surface
on Its Adsorption Properties (Vliyanie prirody poverkhnosti
silikagelya i kvartsa na ikh adsorbsionnyye svoystva) II.
Adsorption of Steam, Methyl Alcohol and Nitrogen on Silica
Gel of Different Degrees of Hydration (II. Adsorbtsiya parov
vody, metilovogo spirta i azota na silikagelyakh razlichnoy
stepeni gidratatsii)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 11, pp 2624-2633
(USSR)

ABSTRACT:

Silica gel samples and non-porous "white soot" described in
the previous paper were used. The measurements of the adsorp-
tion were carried out according to the gravimetric method. It
was found (Fig. 1) that with samples treated at 300°C the ad-
sorption (at constant p/p_s) decreases with a decrease of the
degree of hydration of the surface. The different adsorbability
of the investigated silica gels is not due to their structure

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SOV/76-32-11-25/32

The Effect of the Nature of the Silica Gel and Quartz Surface on Its Adsorption Properties. II. Adsorption of Steam, Methyl Alcohol and Nitrogen on Silica Gel of Different Degrees of Hydration

but to the chemical nature of the surface (their degree of hydration). It is assumed that the hydroxyl groups with water molecules can form hydrogen compounds on the surface (Ref 12), and thus act as adsorption centers. Contradicting data given by other authors on the adsorption centers mentioned above (Refs 15,16) are explained by a different technique of investigation. As the hydration of the surface of the investigated samples is different the adsorption properties of the surface with respect to the molecules capable of forming hydrogen compounds with hydroxyl groups are also different. Measurements carried out of the surface of hydrated KSK-1 samples occupied by water molecules showed that within the range of p/p_0 from 0.1 to 0.3 the value ω , changes from 39 to 22.5 \AA^2 and thus is considerably higher than that given in publications (10.6 and 14.8 \AA^2) (Refs 20-22). As the adsorption properties are functions of several factors (crystallography of the sample, chemical composition etc.) they cannot be called "absolute" properties ("absolute" isothermal lines). The authors thank M. M. Dubinin and B. V. Il'in.

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The Effect of the Nature of the Silica Gel and Quartz Surface on Its Adsorption Properties. II. Adsorption of Steam, Methyl Alcohol and Nitrogen on Silica Gel of Different Degrees of Hydration

There are 8 figures and 29 references, 22 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 5, 1957

Card 3/3

AUTHORS: Yegorov, M. N., Zarif'yants, Yu. A., Kiselev, V. F., Krashil'nikov, Z. G. C.I.T./20-10-2-26/65

TITLE: The Adsorption Properties of Alumo-Silicate Catalysts and Their Dependence Upon Composition (Adsorbsionnye svoystva alumo-sillikatnykh katalizatorov i ikh zavisimost' ot sostava)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 2, pp. 326 - 329 (USSR)

ABSTRACT: In some previous papers (Refs 1-4) it was shown that the adsorption properties per unit of surface with respect to water and ethyl alcohol molecules are to a considerable extent dependent upon the degree of hydration of the surface. It would be of interest to extend such investigations to a number of alumo-silicates of varying composition. In the first stage of these studies the authors investigated the adsorption of steam and of methyl alcohol vapors and the heat necessary to wet the synthetic alumo-silicate compounds. The catalysts had a content of 15% (Gudri catalyst), of 30% and of 50% of Al_2O_3 . The measurements of adsorption were carried out in a calorimeter with constant heat exchange. A diagram gives the

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The Adsorption Properties of Alumo-Silicate
Catalysts and Their Dependence Upon Composition

SCV/20-121-2-23/63

Function of the heat required for wetting by water versus the content of crystal water for all alumo-silicate under investigation. These curves exhibit maxima which represent the thermal pre-treatment of the samples at 200-300°. The comparatively high content of crystal water is of interest, in particular in the samples with a high Al_2O_3 content. The heats of wetting differ by about the double between silicagel and alumo-silicate with a low Al_2O_3 content (15%) even with a similar hydration of the surface. The same samples were also used for the determination of the isothermal lines of the adsorption of steam and of n -ethyl alcohol vapors. The desorption isothermal lines of all samples are considerably below the adsorption isothermal lines. Silicagel, however, did not show such a behaviour. The structure of alumo-silicates is similar to that of silicon, its surface, however, is more inhomogeneous. Investigation of the adsorption mechanism cannot be limited to the local adsorbed molecules with active centers, and their topography and their concentration must be taken into account. In conclusion the authors express their gratitude

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The Adsorption Properties of Alumino-Silicate
Catalysts and Their Dependence Upon Composition

SOV/2c-12c-2-28/63

to B.V.Il'in for the help rendered by him in this work and to
K.V.Torchiyev for his unsabated interest and for his furnishing the
samples. There are 3 figures, 1 table, and 16 references, 15 of
which are Soviet.

ASSOCIATION: Fizicheskiy fakultet Moskovskogo gosudarstvennogo universiteta
im.M.V.Lomonosova (Dept. of Physics of the Moscow State University
imeni M.V.Lomonosov)

PUBLISHED: January 15, 1958, by M.M.Dubinin, Member, Academy of Sciences,
USSR

SUBMITTED: January 6, 1958

1. Aluminum silicate catalysts--Adsorptive properties
2. Aluminum silicate catalysts--Physical properties

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5(4)

AUTHORS:

Yegorova, T. S., Kiselev, V. F.,
Krasil'nikov, K. G.

SOV/20-123-6-28/50

TITLE:

The Differential Heats of the Adsorption of Water Vapors on
Silica Gels of Different Hydration (Differentsial'nyye teploity
adsorbsii parov vody na silikagelyakh razlichnoy gidratatsii)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 1060-1063
(USSR)

ABSTRACT:

No reliable data have hitherto been published on the dependence of the differential adsorption heats of water vapors on the filling up of the surface. In the present paper the silica gels K - 2 and KSK - 3 were used. The characteristic data of the adsorption on these samples are given in a table. The adsorption heats of the vapors were measured in a calorimeter similar to that described by reference 7; the wetting heats were measured in a calorimeter with constant heat exchange. The water vapors were adsorbed at constant vapor pressure. The authors investigated the initial domains of isothermal lines and of the differential adsorption heats of water vapors in various silica gels by means of two methods. A diagram shows the wetting heats

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The Differential Heats of the Adsorption of
Water Vapors on Silica Gels of Different Hydration

SOV/20-123-6-28/50

as functions of the previously adsorbed quantity of water. In a previous paper (Ref 1) homogeneous large-pore adsorbents were investigated within the domain of adsorption up to the beginning of capillary condensation. The results obtained by calculating the differential adsorption heat as a function of specific adsorption are shown in form of a diagram. The adsorption heats for the silica gel K - 2 - 300°, which were determined by means of direct calorimetical measurements, agree well with the theoretically calculated curves. The initial values of water adsorption on silica gel KSK are within the interval of 15 - 20 kcal/mol. At low degrees of filling the adsorbed molecules form 3 or even 4 hydrogen bonds with the hydroxyls of the surface. Part of the molecules is probably adsorbed within this domain on centers of higher energy. In the case of one and the same degree of filling the differential heats decrease with a decreasing degree of hydration of the surface. Also the differential entropy of water vapor adsorption

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The Differential Heats of the Adsorption of
Water Vapors on Silica Gels of Different Hydration

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decreases with increasing surface hydration of the silica gels.
The authors thank B. V. Il'in for his interest in this work
and for discussing results. There are 3 figures, 1 table, and
14 references, 10 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

PRESENTED: May 28, 1958, by M. M. Dubinin, Academician

SUBMITTED: May 26, 1958

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5(3), 5(4)

AUTHORS:

Zarif'yants, Yu. A., Kapitonova, N. V., Kiselev, V. F.,
Krasil'nikov, K. G.

SCV/15C-59-1-12/54

TITLE:

The Adsorption of Benzene Vapors on Aluminosilicates of
Various Composition (Adsorbtsiya parov benzena na aljumino-
silikatakh razlichnogo sostava)

PERIODICAL:

Nauchnyye doklady vyschey shkoly. Khimiya i khimicheskaya
tekhnologiya, 1959, Nr 1, pp 48 - 51 (USSR)

ABSTRACT:

The insertion of AlO_4 tetrahedrons in the structure of
silica leads to a variation of the hydrated as well as
unhydrated sectors of the surface. Thus also the ad-
sorption properties vary during the transition from pure
silica to aluminosilicates of various composition. Alumino-
silicates with a content of 15% and 30% Al_2O_3 as well as
the aluminogel AT and silica gel K-2 were investigated.
The isothermal lines of adsorption are given in diagrams.
The initial sections (in enlarged reproduction) lie

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The Adsorption of Benzene Vapors on Aluminosilicates
of Various Composition

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on a curve, and the adsorption rises with increasing Al_2O_3 content. This cannot be explained by an increase of the adsorption potential in the pores. The adsorption of alumino-gel is higher than that of equally porous aluminosilicate with 15% Al_2O_3 and of more fine-porous silica gel. The variation of the adsorptive capacity seems to depend on changes of the surface structure. This will be investigated with nonporous adsorbents in a future work. V. T. Bykov (Ref 8) assumed that the so-called "absolute" adsorption properties of the surface of silica and aluminosilicates are equal and extended this statement to various kinds of adsorbents. This is a false presumption, based on unfounded presuppositions. Actually, a function must be effective here which depends just on the specific properties of the surface of the individual adsorbents. The range, for instance, which is occupied by a benzene molecule on silica gel is larger than that on the alumino-gel. Gratitude is expressed to B. V. Il'in for his assistance in this work. There are 2 figures and 16 refer-

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The Adsorption of Benzene Vapors on Aluminosilicates
of Various Composition SOV/156-59-1-12/54

ences, 14 of which are Soviet.

ASSOCIATION: Kafedra obshchey fiziki Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of General Physics of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 10, 1958

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SOV/153-2-3-9/29

5(4)
AUTHORS:

Yegorov, M. M., Kiselev, V. F., Krasil'nikov, K. G.,
Simanov, Yu. P.

TITLE:

The Influence of the Phase Composition of the Adsorbents
in the System $\text{Al}_2\text{O}_3 \cdots \text{H}_2\text{O}$ on Their Surface Properties

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya
tekhnologiya, 1959, Vol 2, Nr 3, pp 360-365 (USSR)

ABSTRACT:

Cherenkov aluminum oxide from the laboratory of K. V. Topchiyeva
khimicheskiy fakul'tet MGU (Chemical Department of Moscow State
University) was used for the investigation. The dehydration at
different temperatures was investigated (Fig 1). Phase investi-
gations were carried out by X-ray methods with cameras of the
type RDK-57 and with X-ray tubes of the type BSV. The samples
were tempered at different temperatures and the wetting heat
was determined (Table). The results are - referred to 1 g
oxide - represented in diagrams (Fig 2). A second representation
is given with respect to the surface unit (Fig 3). A dependence
between the structural water and the wetting heat per surface
unit was found (Fig 4). The phase change and the change of the
degree of wetting of the surface causes a sharp change of the

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The Influence of the Phase Composition of the SOV/153-2-3-9/29
Adsorbents in the System $\text{Al}_2\text{O}_3 - \text{H}_2\text{O}$ on Their Surface Properties

surface properties. The authors thank K. V. Topchiyeva and
B. V. Il'in for their assistance in the investigations.
There are 4 figures, 1 table, and 10 references, 7 of which
are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova -
Kafedra fiziki (Moscow State University imeni M. V. Lomonosov -
Chair of Physics)

SUBMITTED: April 24, 1958

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5(4)

SOV/76-33-1-11/45

AUTHORS: Yegorov, M. M., Kiselev, V. F., Krasil'nikov, K. G., Murina, V. V.

TITLE: The Effect of the Surface Nature of Silica Gel and Quartz on Their Adsorption Properties (Vliyaniye prirody poverkhnosti silikagelya i kvartsa na ikh adsorbsionnyye svoystva) III. Heats of Wetting of Silicon Dioxide With Various Liquids (III. Teploty smachivaniya kremnezema razlichnymi zhidkostyami)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 65-73 (USSR)

ABSTRACT: In connection with previous papers the effect of the hydration of the surface of silicon dioxide on the adsorption energy of water and methanol in the form of heat of wetting (HW) is investigated. HW was determined in several SiO_2 samples with water, methanol, n-propanol, and n-heptane in dependence on the hydration degree of the surface. Data on the HW of the silica gels KSK with water were taken from M. M. Yegorov's thesis (Ref 18). The HW was measured by means of a calorimeter with a temperature sensitivity of $5 \cdot 10^{-5}^\circ\text{C}$. A table of the investigated silica gels with the HW obtained for water is given. An investigation of the effect of the glowing temperature on the HW

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The Effect of the Surface Nature of Silica Gel and Quartz on Their Adsorption Properties. III. Heats of Wetting of Silicon Dioxide With Various Liquids

SOV/76-33-1-11/45

(Fig 1) showed that a glowing temperature of 200-300°C the function curves pass through a maximum. An increase in the glowing temperature up to 1000°C resulted in a surface decrease, e. g. in silica gel K-2, of several m^2/g . A treatment at 300°C is considered the standard. Here, the dependence of the HW on the hydration of the surface is expressed by a straight line. A wetting of thermally dehydrated samples with water results in the formation of hydration heat. A hydrated quartz surface differs qualitatively from a corresponding silica gel surface which can be explained by the closer packing of the hydroxyl groups (in quartz); however, investigations have still to be carried out in this respect (e. g. according to the method of the core-paramagnetic resonance). The HW of methanol does not depend on the porosity of the silica gels, which is the case with n-propanol and n-heptane. In the case of partly dehydrated surfaces a greater HW is obtained by the use of methanol than by that of water which can be explained by the effect of the methyl group in the adsorption. The results of the investigations show that the HW

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The Effect of the Surface Nature of Silica Gel and Quartz on Their Adsorption Properties. III. Heats of Wetting of Silicon Dioxide With Various Liquids

SOV/76-33-1-11/45

of the silica gel with water and methanol depends essentially on the hydration degree of the surface which is not the case with n-heptane. The authors thank B. V. Il'in and G. I. Aleksandrova. There are 3 figures, 1 table, and 22 references, 14 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

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05806

SOV/76-33-10-4/45

5(4)
AUTHORS:Yegorov, M. M., Kiselev, V. F., Krasil'nikov, K. G.
On the Problem of the Adsorptive Power of a Unit of the
Quartz Surface

TITLE:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2141-2144
(USSR)

PERIODICAL:

ABSTRACT: Since the quantity of adsorbed OH groups depends on the number of free corners of the SiO_4 tetrahedron which project into the surface of the silica-gel skeleton, it was assumed (Refs 2-4) that differences in the degree of hydration of silica gels (Refs 1-4) is connected with the manner in which the tetrahedron is packed (in dependence on the conditions of silica-gel preparation). The adsorptive properties of samples of amorphous silicon dioxide of various origin (silica gels and quartz glass) were therefore compared with those of quartz samples since the latter has the densest packing of SiO_4 tetrahedrons.

The authors investigated powder samples obtained by grinding (carried out by L. A. Feygin), crystalline quartz and transparent quartz glass. The samples were ground in dry state as well as under the addition of water. The adsorptive properties of the samples are listed (Table: quartz, Kv-1, -2, -3 samples, quartz glass, sample KS-1 and the silica gels KSK-1

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SOV/76-33-10-4/45

On the Problem of the Adsorptive Power of a Unit of the Quartz Surface
and K-2). Comparison of the adsorption isothermal lines (Fig)
shows that the adsorptive power of quartz depends on the con-
ditions under which the samples were pulverized. The adsorp-
tion isothermal lines of the samples which were ground in dry
state or with a small addition of water attain considerably
higher values than those of samples ground in wet state. The
isothermal lines of water vapor adsorption of samples (ground
under the same conditions) obtained from crystalline quartz
Kv-3 and quartz glass KS-1 (Fig 1) indicate that the isothermal
line of isotropic quartz glass attains higher values than that
of crystalline quartz. Accordingly, results do not confirm the
view of A. V. Kiselev (Refs 11, 12) as to the same adsorptive
properties of crystalline and amorphous silicon dioxide. In
conclusion, the authors thank K. V. Chmutov. There are 2 fig-
ures, 1 table, and 12 references, 9 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 26, 1958

Card 2/2

5(4)
AUTHORS:

Bakayev, V. A., Kiselev, V. F.,
Krasil'nikov, K. G.

SOV/20-125-4-40/74

TITLE:

The Reduction of the Melting Temperature of Water in the
Capillaries of a Porous Body (Ponizheniye temperatury plavleniya
vody v kapillyarakh poristogo tela)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 4, pp 831-834
(USSR)

ABSTRACT:

From the data concerning the phase composition of an adsorbed substance as a function of temperature it is possible to determine the quantitative characteristic of the structure of a porous body by determining not only the radius but also the volume of the capillaries in which the phase transformations take place. The quantity of adsorbed substance in 1 g of the adsorbent melting at the temperature T can be determined from the specific heat of the system adsorbent-adsorbed substance. A more simple, but sensitive method is that of indirect determination of heat capacity by measuring the temperature conductivity λ of the system. The authors carried out these measurements by employing the modified method of "linear temperature increase". The adsorbents used were the silica gels KSK-2,

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The Reduction of the Melting Temperature of Water in the SOV/20-125-4-40/74
Capillaries of a Porous Body

KSM-1 and a specimen of a non-porous alumina BS-1. In these samples the isothermal lines of the adsorption of water vapors were measured. Measurements of temperature conductivity were carried out ranging from the temperature of liquid nitrogen to the temperature of 275° K. The dependences of the quantity const/λ on temperature thus determined are shown by a diagram. The theory of capillary condensation shows a connection between the reduction of temperature of the phase transformation and the radius of the capillaries containing the adsorbent substance. A connection between the freezing temperature of water and the radius of the pores can be derived. The points in the diagram $\Delta T = f(10^3/r)$, which were determined for various samples and by various methods, are well suited for a straight line. The method of determining const/λ suggested by the authors makes it possible quickly to determine the substance adsorbed in the porous body. Herefrom it is then possible to determine the curve for the distribution of the volume of the pores over their effective radii. The authors thank L. V. Radushkevich for his interest in this investigation.

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The Reduction of the Melting Temperature of Water in SOV/20-125-4-40/74
the Capillaries of a Porous Body

There are 3 figures and 8 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov). Institut
fizicheskoy khimii Akademii nauk SSSR (Institute of Physical
Chemistry of the Academy of Sciences, USSR)

PRESENTED: December 24, 1958, by M. M. Dubinin, Academician

SUBMITTED: December 17, 1958

Card 3/3

5 (4), 15 (2)

AUTHORS:

Ganichenko, L. G., Kiselev, V. F.,
Krasil'nikov, K. G.

sov/20-125-6-29/61

TITLE:

The Influence of the Hydration of the Surface of Silica on the
Adsorption of Aliphatic Alcohols From Solutions (Vliyaniye
gidratatsii poverkhnosti kremnezema na adsorbsiyu
alifaticheskikh spirtov iz rastvorov)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6,
pp 1277-1280 (USSR)

ABSTRACT:

The influence exercised by the hydration of the surface of silica is investigated for the adsorption of steam (Ref 1) and saturated hydrocarbons (Ref 2). In the former case this influence is considerable, in the latter it is insignificant. It was therefore of interest to investigate this influence in the adsorption of alcohols which have both hydroxyl groups and carbon chains. Measurements were carried out of the adsorption of methanol-, n-propanol-, n-hexanol, and n-octanol from carbon tetrachloride solutions. Two samples of non-porous silica - "white carbon black" - BS-1 and BS-2 were used. The samples were annealed before the experiments at 300°, one of the BS-2 samples also at 700°. The results obtained are

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The Influence of the Hydration of the Surface of Silica on the Adsorption of Aliphatic Alcohols From Solutions SOV/20-125-6-29/61

shown by table 1. Figure 1 shows the isothermal lines of adsorption, figure 2 shows the dependence a) of the adsorption maximum, b) of the surface occupied by the adsorbed molecules, c) of the thickness of the adsorption layer, d) of the ratio between the adsorbed molecules and the number of hydroxyl groups on the degree of surface hydration. Whereas methanol is still considerably influenced by the degree of hydration, this influence decreases with an increase of the carbon chain. The adsorption of octanol is not influenced at all. With an increasing length of the carbon chain the behavior of the alcohols thus approaches that of the hydrocarbons. Further, the marked increase in thickness of the adsorption layer of methanol is discussed. It is explained by variation of molecule orientation, which may be caused by a polymorphic transformation due to the thermal treatment of the silica, and leads to steps or discontinuities in the adsorption isothermal line. There are 3 figures, 1 table, and 15 references, 13 of which are Soviet.

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The Influence of the Hydration of the Surface of Silica on the Adsorption of Aliphatic Alcohols From Solutions SOV/20-125-6-29/61

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

PRESENTED: December 30, 1958, by M. M. Dubinin, Academician

SUBMITTED: December 24, 1958

Card 3/3

3/052/40/000/309/002/021
302/3C55

AUTHORS: Gorchenko, L. G., Dobrotin, M. M., Gavrilova, Ye. D., Krasil'nikov, Yu. S., and Krasheninnikov, V. G.

TITLE: Study of the Vapor Absorption on Absorbents With Heterogeneous Surfaces. Communication 2. Experiments With Organically Substituted Silica Gel

PERIODICAL: Izvestiya Akademii Nauk SSSR. Otdeleniye Khimicheskikh Nauk, 1960, No. 9, pp. 1535-1545

TEXT: The adsorption of various vapors on methylated porous silica gel and a deethylated sample obtained therefore is discussed here. The conditions of investigation were chosen in such a way that an essential change of the specific surface seemed to be unlikely. Carbon-porous organically substituted silica gel (S-1) was taken as the test sample and carefully purified from iron and other impurities. To purify the surface, silica gel was repeatedly treated with dichloro diisobutyl alkane vapor at 200°C, and silica gel washed with water until the reaction for the chlorine ion was negative. Then, the vapors were added one by one successively; 1000, and silica gel washed with water until the reaction for the chlorine ion was negative. The

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silica gel thus obtained is called C-1 (S-1). A portion of silica gel S-1 was treated with nitric acid vapors at 200°C for 3 hours. The organic part of the surface was oxidized, the OH groups saturated by NH groups, and the substituted silica gel, which hydrophilic properties became hydrophobic. This specimen is called C-2 (S-1). The composition of the surface of silica gel S-1 and S-2 was determined by an infrared analysis. The analysis was carried out at the same time as the determination of the weight losses in calcination at 1250°C. Table 1 shows the analytical results. It may be seen that the substitution of the surface leads to an increase of its degree of hydration. The specific surfaces of the specimens changed by 3% (Nitrogen, cyclohexane, benzene), whereas they were used as adsorbents. Figs. 1-4 show the absorption isotherms of the absorption isotherms of the vapors of three substances in oil bases. The isothermal lines for S-1 are lower than those for S-2. Table 2 gives a comparison of the specific sorption volumes. The authors explain their results with the help of the respective published data. Summarizing up, the

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substitution of one part of the hydroxyl groups of the silica gel surface by methyl groups leads to a reduction of its adsorptive power toward substances in the upper layer. 2) To determine the specific function in the occupied and individual layers, 2) To determine the specific surface in the adsorbent with a chemically homogeneous surface (on the basis of the question by Brunauer, Emmett, and Teller for the adsorbates with a thermal line). It is necessary to select the adsorbates with special care. They should be little sensitive as possible to the chemical heterogeneity of the substance. Yu. M. Kurbatov is mentioned. There are 5 figures, 4 tables, and 36 references in Soviet, 2 US, 1 British, 6 German, and 1 Swiss.

ASSOCIATION: Institut Fizicheskoy Khimii Akademii Nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR).

Nikolaevsky road, University 1a, M. V. Losonetska

(Moscow State University 1a, M. V. Losonetska)

SUBMITTED: April 2, 1959

Card 3/3

KISELEV, V.F.; KRASIL'NIKOV, K.G.

Effect of the nature of the silica surface on its adsorptive properties.
Probl. kin. i kat. 10:415-420 '60. (MIRA 14:5)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.
(Silica) (Adsorption)

KRASIL'NIKOV, K.G.; KISELEV, V.F.

Adsorptive properties of aluminosilicates and alumina gel. Probl.
kin. i kat. 10:421-425 '60. (MIRA 14:5)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.
(Aluminosilicates) (Alumina) (Adsorption)

67896

S/020/60/130/06/026/059

15.2110

5(4)

AUTHORS: Kiselev, V. F., Krasil'nikov, K. G., B004/B0C7

Khodakov, G. S.

TITLE: The Influence of the Aggregation of Quartz Particles During
Grinding Upon Its Adsorptive Properties

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 6, pp 1273 - 1276
(USSR)

ABSTRACT: In reference 1 it was said that the specific surface of air-dried quartz decreases with an increase of the duration of grinding. This was explained by the aggregation of the quartz particles. The authors aimed at investigating this phenomenon more thoroughly and to find out whether its effects on the adsorption of nitrogen, and water differ. They maintain that this phenomenon is the cause of the considerable discrepancy in published data for adsorption values and adsorption energy of quartz. Two samples of highly dispersive quartz were investigated. Sample Kv-4 was obtained by grinding transparent crystalline quartz with an excess of water, sample Kv-4A by further grinding Kv-4 in air. On both samples, the adsorption of nitrogen and steam was measured (Table 1). As shown by

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The Influence of the Aggregation of Quartz Particles S/020/60/130/06/026/059
During Grinding Upon Its Adsorptive Properties B004/B007

figure 1, the adsorption isothermal line of nitrogen on Kv-4A is lower than in the case of Kv-4 because of particle aggregation, whereas the adsorption isothermal line of steam is higher. Also figure 2 shows that the different kind of grinding the same quartz affects the adsorption of nitrogen and steam differently. This phenomenon has not yet been explained. It is presumed that relatively dense aggregates are formed, the inner surfaces of which are inaccessible to the nitrogen, whereas the adsorption of water is not impaired by these aggregations because of its dispersive (peptizing) properties. Such phenomena of aggregation were observed also in the case of other substances (corundum, calcite, silica gel) in dry grinding. The authors thank Academician P. A. Rebiner for his interest in this paper, and G. I. Aleksandrova for assisting in measurements. There are 2 figures, 1 table, and 21 references, 13 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov). Vsesoyuznyy
nauchno-issledovatel'skiy institut novykh stroitel'nykh
Card 2/3

67896

The Influence of the Aggregation of Quartz Particles S/020/60/130/06/026/059
During Grinding Upon Its Adsorptive Properties B004/B007

materialov (All-Union Scientific Research Institute for New
Building Materials)

PRESENTED: October 20, 1959 by P. A. Rebinder, Academician

SUBMITTED: October 13, 1959

✓

Card 3/3

BONDARENKO, A.V.; KISELEV, V.F.; KRASIL'NIKOV, K.G.

Composition of products of the thermal dehydration of silica and
properties of its dehydrated surface. Kin.i kat. 2 no.4:590-598
Jl-Ag '61. (MIRA 14:10)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova,
fizicheskiy fakul'tet.
(Silica) (Dehydration (Chemistry))

GANICHENKO, L.G.; KISELEV, V.F.; KRASIL'NIKOV, K.G.; MURINA, V.V.

Effect of the nature of silica gel and quartz surfaces on
their adsorption properties. Part 4: Adsorption and heat of
adsorption of aliphatic alcohols on powdered silica gel.
Zhur.fiz.khim. 35 no.8:1718-1726 Ag '61. (MIRA 14:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.
Lomonosova.
(Alcohols) (Adsorption) ✓

YEGOROV, M.M.; KISELEV, V.F.; KRASIL'NIKOV, K.G.

Effect of the nature of silica gel and quartz on their adsorptive capacities. Part 5: Structure of the surface of crystalline and amorphous modifications of silica. Zhur. fiz. khim. 35 no. 9:2031-2038 '61. (MIRA 14:10)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Silica) (Adsorption)

YEGOROV, M.M.; KISELEV, V.F.; KRASIL'NIKOV, K.G. (Moscow)

Effect of the nature of silica gel and quartz surfaces on their adsorption properties. Part 5: Adsorption of water vapor on the surface of crystalline and amorphous modifications of silica.
Zhur.fiz.khim. 35 no.10:2234-2240 O '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Adsorption) (Silica)

BONDARENKO, A.V.; KISELEV, V.F.; KRASIL'NIKOV, K.G.

Thermal dehydration of silica and certain properties of its surface.
Dokl.AN SSSR 136 no.5:1133-1136 F '61. (MIRA 14:5)

1. Moskovskiy gos.universitet im. M.V.Lomonosova. Predstavлено akad.
M.M.Dubininym.
(Silica) (Dehydration) (Surface chemistry)

S/076/62/036/009/002/011
B101/B102

AUTHORS: Yegorov, M. L., Ignat'yeva, L. A., Kislev, V. F., Krasil'nikov, G., and Topchiyeva, K. V.

TITLE: Study of the surface properties of catalytic aluminum oxide

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 9, 1962, 1882 - 1889

TEXT: The specific heat of wetting of commercial Al_2O_3 by water, methanol, ethanol, and n-heptane, and the content of structural water Al_2O_3 were measured, the phase composition of Al_2O_3 was determined by x-ray analysis, and the infrared spectrum of deuterated Al_2O_3 was taken. Whereas with n-heptane the heat of wetting is independent of the content of structural water in Al_2O_3 , it increases, in the case of water and alcohols, with increasing thermal dehydration of Al_2O_3 . Since, however, the specific surface of Al_2O_3 becomes smaller at high annealing temperatures, the heat of

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S/076/62/036/009/002/011
B101/B102

Study of the surface ...

wetting calculated per g of Al_2O_3 reaches a maximum for Al_2O_3 heated at 500°C. The curve for heat of wetting (Q , erg/cm²) versus structural water ($\mu\text{mole}/\text{m}^2$) shows the following sections: (1) Increase of Q after thermal treatment of Al_2O_3 at 20 - 150°C owing to removal of the adsorbed H_2O ; (2) unchanged Q at 170 - 200°C in spite of dehydration of the bayerit in the bulk of Al_2O_3 ; (3) a increase at 200 - 300°C owing to dehydration of the Al_2O_3 surface; (4) sharp increase of Q between 500 and 700°C, although the content of structural water changes only little in this range owing to formation of $\gamma-\text{Al}_2\text{O}_3$; (5) increase of Q at 800-900°C owing to formation of K , δ , θ , and $\alpha-\text{Al}_2\text{O}_3$ (corundum). The infrared spectrum of deuterated Al_2O_3 showed a broad 2630 cm⁻¹ band which disappeared at 400°C (interacting OD groups), a narrow band at 2755 cm⁻¹ (free, non-interacting OD groups), and a narrow 2710 cm⁻¹ band (weakly bound OD groups). For gibbsite, maximum hydration was calculated to be $\sim 22 \mu\text{mole}/\text{m}^2$; for the (0001) face of corundum, the hydration amounts to $12.7 \mu\text{mole}/\text{m}^2$. The coordination sphere of the Al

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APPROVED FOR RELEASE: Monday, July 31, 2000

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Study of the surface ...

surface atoms which is not fully occupied after the thermal dehydration is filled up by water or alcohols with formation of hydrate or alcoholates, respectively. The irreversible sorption of alcohols increases after thermal treatment of Al_2O_3 at high temperature. There are 4 figures and 2 tables.

ASSOCIATION: Moskovskiy Gosudarstvennyy universitet im. M. V. Lomonosova, Fizicheskiy i khimicheskiy fakul'toty (Moscow State University imeni M. V. Lomonosov, Physical and Chemical Departments)

SUBMITTED:

November 1, 1960

Card 3/3

KRASIL'NIKOV, K.G.

Sorption of water vapors on calcium hydrosilicates. Dokl. AN
SSSR 143 no.4:911-914 Ap '62. (MIRA 15:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavлено академиком P.A.Rebinderom.
(Calcium silicates) (Water vapor) (Sorption)

KVLIVIDZE, V.I.; KRASIL'NIKOV, K.G.

State of water sorbed on calcium hydrosilicate studied by means of
nuclear magnetic resonance. Dokl.AN SSSR 145 no.6:1305-1307
Ag '62. (MIRA 15:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavлено академиком P.A.Rebinderom.
(Water) (Sorption) (Nuclear magnetic resonance and
relaxation)

YEGOROV, M.M.; IGNAT'YEVA, L.A.; KISELEV, V.F.; KRASIL'NIKOV, K.G.;
TOPCHIYEVA, K.V.

Surface properties of catalytically active aluminum oxide.
Zhur. fiz. khim. 36 no.9:1882-1889 S '62. (MIRA 17:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
fizicheskiy fakul'tet i khimicheskiy fakul'tet.

KRASIL'NIKOV, K.G.

Calculation of the specific surface area of tobermorite from its
crystal lattice parameters and adsorption data. Dokl. AN SSSR
149 no.4:891-893 Ap '63. (MIRA 16:3)

1. Moskovskiy gosudarstvenny universitet im. Lomonosova.
Predstavлено академиком P.A.Rebinderom.
(Tobermorite) (Crystal lattices) (Adsorption)

GOROSHKO, O.A. [Horoshko, O.O.]; KRASIL'NIKOV, K.V. [Krasyl'nykov, K.V.]

Transverse vibrations of a string (cable) of variable
length. Dop. AN URSR no.3:319-322 '64. (MIRA 17:5)

1. Institut mekhaniki AN UkrSSR i Dnepropetrovskiy gosudarst-
vennyy universitet. Predstavлено akademikom AN UkrSSR G.N.
Savinym [Savin, H.M.].

RUBAN, P.I.; KRASIL'NIKOV, K.V.

One of the methods for the approximation of functions satisfying Lipschitz's conditions by trigonometric polynomials. Izv.vys. ucheb.zav.; mat. no.1:194-107 '60. (MIRA 13:6)

1. Dneprodzerzhinskiy vecherniy metallurgicheskiy institut imeni Arsenicheva.
(Functions, Periodic)

RUBAN, P.I. (Dneprodzerzhinsk); KRASIL'NIKOV, K.V. (Dneprodzerzhinsk)

Approximation by trigonometric polynomials of functions of two variables satisfying Lipschits' condition. Izv. vys. ucheb. zav.; mat. no. 3:135-136 '63. (MIRA 16:4)

(Functions, Periodic) (Polynomials)

KRASIL'NIKOV, K.V., inzh.

Characteristics of the movement of flexible guides with pinched ends. Izv.vys.ucheb.zav.; ger. zhur. 6 no. 12:141-145 '63.
(MIRA 17:5)

1. Dnepropetrovskiy gosudarstvennyy universitet. Rekomendovana kafedroy teoreticheskoy mekhaniki.

RUBAN, P.I. (Dneprodzerzhinsk); KRASIL'NIKOV, K.V. (Dneprozerzhinsk)

Use of trigonometric polynomials in the approximation of
even functions satisfying Lipshits' condition. Izv. vys.
ucheb. zav.; mat. no.2:136-138 '64. (MIRA 17:8)

3798L
S/137/62/000/005/117/150
A006/A101

19.8.2001

AUTHOR: Krasil'nikov, L. A.

TITLE: Some problems concerning methods of conducting stress-relaxation tests with wire

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 98, abstract 51601 ("Tr. Konferentsii po metizn. proiz-vu, 1959", Chelyabinsk, 178-183)

TEXT: The possibility was studied of using for thin wire the method of relaxation tests applied to a spring strip. According to this method, the relaxation stress is the difference between the initial and relieved stresses and is determined for both a straight and initially curved wire state. The method of determining stress-relaxation in a wire during plain bending should be used for a wire of ≤ 0.5 mm in diameter, as at a greater diameter, the measurement of the wire curvature becomes more difficult and, moreover, large-capacity furnaces or liquid baths are required. For more precise investigations of relaxation processes in plain twisting, a device was designed which makes it possible to obtain curves of relaxation processes in plain twisting. The twisting of the specimen under investigation on an operating model of the machine is brought about with the aid

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Some problems concerning methods...

S/137/62/000/005/117/150
A006/A101.

of a contour rotating due to interaction of magnetic fields inside two fixed coils; one of the wire-specimen ends is fixed on the axis of the movable contour and the other end in a fixed clamp. To establish a connection between the shear stress and voltage in the contour, the device is calibrated by small weights. The initial shear stress during the performance of relaxation tests is set by establishing a definite current value in the contour. To perform tests at elevated temperatures ($100 - 600^{\circ}\text{C}$), the device is equipped with a furnace with automatic temperature control.

Ye. Assonova

[Abstracter's note: Complete translation]

Card 2/2

28(5)

AUTHORS:

Krasil'nikov, L. A., Karavayev, V. B.

SOV/32-25-7-32/50

TITLE:

Automatic Recording of the Relaxation of Tension in Wire
(Avtomaticheskaya registratsiya relaksatsii napryazheniy v
provloke)

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 7, pp 869-871 (USSR)

ABSTRACT:

In order to obtain correct data on the behavior of springs in use not only the mechanical properties have to be determined but also the resistance of the relaxation of tension (RT) and of elasticity at various states of tension (Refs 1-3). The resistance of (RT) is usually determined by measuring the rest deformation which appears gradually, caused by elastic deformation. A device was designed according to the principle of (Ref 4) by which the tension drop can be determined under the effect of a moment of torsion in a wire spring at 100-600° without measuring the deformation. The variation of the displacement module with temperature is determined together with the variation of tension. The testing conditions can be automatically controlled and the measuring results recorded by this device (Fig 1). The torsion of the sample is caused by the

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SOV/32-25-7-32/50

Automatic Recording of the Relaxation of Tension in Wire

interaction of two magnetic fields, by two stable coils and a frame rotating on its axis. The tension of relaxation is determined by means of a diagram (Fig 2) and the amperage in the frame which is set at a certain angle. During the test the sample is heated in a quartz tube furnace. The temperature is controlled and regulated by two electron potentiometers EPV-01. The measuring results obtained with wire samples of steel of the types 50KhFA and Kh18N9T (Fig 3) show that the primary displacement tension affect the relaxation stability at 200, 400, and 450° with regard to time. There are 3 figures and 5 Soviet references.

ASSOCIATION: Beloretskiy staleprovolochno-kanatnyy zavod (Beloretsk Steel
Wire-Cable Factory)

Card 2/2

18.7100

TP-1
10/11/1986-10/11/1986

AUTHORS: Godovikov, V. A., Koval'chikov, I. A. (and others)

TITLE: Improvement in Technological Process of Needle Wire Production

PERIODICAL: Stal', 1960, Nr 2, pp 173-177 (USSR)

ABSTRACT: In order to improve mechanical properties as well as surface finish of needle wire made of U7A, 88A, and U10A-steel (carbon tool steels containing 0.7; 0.8; and 1.0% C, respectively) the authors worked on the improvement of the patenting process which has been used since 1953 at Beloretsk Steel Wire and Rope Plant (Beloretskiy staleprovolochnokanatnyy zavod). For that purpose the following factors were investigated:
(1) Effect of preliminary heat treatment and total deformation on recrystallization annealing: Industrial and laboratory tests showed that wire subjected to recrystallization annealing after different types of

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